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ABSTRACT

A staff development project created a series of family science activities to be used in adult basic and literacy education (ABLE) and family literacy programs and a training guide for staff and volunteers. The training guide provides background principles and concepts for science activities. The activities identify materials and indicate ways the activities can be incorporated into parent-child interactions. During the year-long project, project staff developed four family science packets centered around the themes of water, weather, magnets, and plants. Each packet contains 7-10 activities that were used by ABLE students and staff in Washington and Greene counties of Pennsylvania. The activities in each packet include the following: an exploratory problem, process skills to be used, concepts to be developed, materials provided, other materials needed, time needed for the activity, instructions, and extension activities. The packets were used with adult students and their young children. The parents who used the activities said the lessons gave them confidence to teach science to their children. The activities also helped to foster a scientific attitude in adult students and their children. (The final report contains six appendixes that contain the following: materials from the training sessions, an evaluation report, a sample survey, the training guide developed for the project, with lesson plans; lists of packet contents, and completed evaluations.) (Author/KC)

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ED 395 107

FAMILY SCIENCE ACTIVITIES FOR ADULT BASIC AND LITERACY EDUCATION

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PDE 353 Project: PA FY 94-95

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ABSTRACT

Title: Family Science Activities for Adult Basic and Literacy Education

Project No.: 98-5025 Funding: $6,375.00

Project Director: Dr. Barbara Mooney Phone No.: (412)852-2893

Contact Person: same as above

Agency Address: 22 West High Street
Waynesburg, Pennsylvania 15370

Purpose: The project proposed to develop materials of basic science concepts and skills that were presented to adult students in traditional ABLE programs and special family literacy programs. Specific activities were provided to these students to foster the development of the concepts and skills with their young children.

Procedures: Project staff developed four Family Science Packets centered around the themes water, weather, magnets and plants. Each packet contains 7-10 activities that were used by ABLE students and staff in Washington and Greene counties. The activities in each packet included an exploratory problem, process skills to be used, concepts to be developed, materials provided, other materials needed, time needed for the activity, instructions and extension activities. The packaged activities were presented to ABLE, Even Start, Family Center and Head Start staff and volunteers in Greene and Washington counties and the packets were used with adult students enrolled in these programs. The students completed an evaluation on the activity they used. Staff and tutors also reported their use by completing a questionnaire.

Summary of Findings: The Family Science Activities are a good resource for volunteers and staff who work with students who have young children. The activity packets will enhance adult students' ability to teach science to their children and give confidence to learn science.

Comments: According to the parents the Family Science Activities gave them the confidence to teach science to their children. The Science activities also helped to foster a scientific attitude in adult students and their children, which included curiosity, positive self-image, positive approach to failure, persistence and inventiveness.

Products: A final report which includes a copy of the handbook developed for the training and activities and photos of materials used.

Descriptors: (To be completed only by Bureau staff):

INTRODUCTION

This staff development project created a series of family science activities to be used in ABLE and Family Literacy programs and a training guide for staff and volunteers. The training guide provides background principles and concepts for science activities. The activities each identify materials and indicate ways the activities can be incorporated into parent-child interactions.

While considerable funding is being targeted for services to "families", quality materials with a family focus, geared to adult students on ABLE and GED levels are difficult to locate. Those in Adult Education know the special needs associated with providing education services to this adult population and must share their expertise with the family literacy programs to enable them to be most effective. Without structured education programs, there is a danger that parents of "at-risk" children, who have limited skills and knowledge themselves, will be unable to assist their children. As one of the Goals 2000 is to improve knowledge of science, this content area deserves special attention. Family Literacy programs need materials such as the Family Science activities we have developed to aid them in including family science education in their services. Through this project's science activity packets, adult learners were provided basic knowledge of science concepts, built "science confidence", and were provided with a means to transmit this knowledge to their children.

This project operated from July 1, 1994 to June 30, 1995. In September, a "Fun with Science" presentation was held for Even

Start, Head Start and Family Center families in western Greene County. This served to introduce "Science Awareness" and get feedback from parents on their science attitudes. Research for the development of activity packets was done October-November. The packets were compiled from December to April, materials having been ordered in February and March. Trainings on the materials were conducted in May. Packets were used in May and June.

The sponsoring agency was Community Action Southwest (CAS). Contributing staff were the agency's personnel: Dr. Barbara Mooney, Project Director; Jane Schrock, Project Coordinator; Dolores Alger and Jeanne Williams, Project Implementors.

This report is targeted for staff, volunteers, and program planners who work with Adult Basic and Literacy Education students who are the parents or guardians of young children. Permanent copies of the report are on file with the Pennsylvania Department of Education, Division of Adult Basic and Literacy Education Programs, 333 Market Street, Harrisburg, PA 17126-0333; AdvancE, Pennsylvania Department of Education Resource Center, Department of Education, 333 Market Street, Harrisburg, PA 17126-0333; and Western Pennsylvania Adult Literacy Resource Center, 5347 William Flynn Highway, Rt. 8, Gibsonia, PA 15044-9644.

BODY OF THE REPORT

A. Statement of the Problem

--Need for Appropriate Materials

Aspects of "Family Literacy" have become an integral part of many ABLE programs across the nation. With Even Start and Family Center programs focusing on strengthening family education, there is a need for quality materials to be used by GED/ABLE level adult students. Many of these students are in family focused programs which have no integral ABLE component and do not have staff which are experienced with adult education needs.

--Need for Materials in Specific Content Areas

Parents involved in these family education programs are learning the importance of reading to children, demonstrating the value of reading, and teaching pre-reading skills to their youngsters. They now must be given similar assistance with developing skills and concepts in specific content areas, both for themselves and their children.

As educators incorporate the development of Family Literacy into ABLE programs, the need for materials devoted to specific content areas, such as science increases. Commercial science materials for ABLE programs do address development of thinking skills and basic science principles, but they do not provide a means for the ABLE student to translate newly learned competencies into a way of presenting science concepts and foundations to their children. One way to address this problem is through the development of "Science Awareness" as a family matter.

--Materials Need to be Easy to Use

One identified need was for materials that would be easy to use by staff and volunteers in programs, like Even Start and Family Centers. They need materials to enable them to incorporate the Family Science activities into their existing curriculum for their adult students to achieve "science awareness".

B. Goals and Objectives

1. To develop a series of 12 Family Science Activity Packets to be used in ABLE classes and one-on-one tutoring sessions with parents of preschool, kindergarten and first grade children. These packets will include training guides for staff and volunteers.

2. To pilot the activity packages with 12 students assigned to our Act 143 funded ABLE program; to then use materials with 12 students involved in a Family Literacy program (either Even Start or Family Center); to record the experiences of staff and volunteers in working with these students, including their observations about how the students reacted to the materials, activities and concepts presented.

3. To present these materials to the staffs and volunteers of local ABLE, Even Start and Family Center programs. This will include explaining the underlying science principle that each activity is designed to teach to the ABLE student, and illustrating ways the activity can be incorporated into the existing curriculum.

4. To record feedback from students, tutors and staff regarding the usefulness of the activity packages in promoting the development of science concepts and the usefulness of these materials to enable adult students to transfer newly learned

concepts to their children.

C. Procedures

In August ideas were developed and materials gathered for a "Fun with Science" group family activity in western Greene County involving Even Start, Head Start, Family Center and ABLE students with preschool/kindergarten children. This family group activity, which was held in September, served to introduce "Science Awareness" to parents and children and gather feedback from parents on their attitude toward science. Based on the parents' feedback several topics were identified (such as magnets, seeds and water) which they did not feel comfortable teaching their children and wanted additional help. Research for the science activities took place in October and November, which involved reviewing various Science books, materials and science curriculum. A bibliography is included in the handbook (page 56).

Development of the science packets and staff/tutor training guide continued through April, with materials being ordered in February and March. A total of 34 activities were developed centered around four science themes (weather, water, plants and magnets). These themes were chosen because they involve common, recognizable subjects that are found in everyday life. In addition, they provide a base of science understanding which many adults may lack. Materials for the packets included: funnels, droppers, plastic medicine vials, cork, various graphs, cotton batting, various pictures and books, weather cycle puzzle, thermometers, dry seeds, magnifying glasses, alfalfa seeds, cheese cloth, potting soil, popcorn seeds, life stages of plant cards,

plaster of paris, magnets, iron nails, iron fillings, general supplies such as paper clips, glue, straws, plastic trays, plastic bags, cups and spoons, rubber bands, toothpicks, food coloring, string, brass fasteners, heavy paper, yarn, and aluminum foil. The training guide and all the activity packets were completed in April. As adult students progressed through the science packets they completed questionnaires that aided staff in making appropriate changes in the activities.

A staff training, conducted by Jeanne Williams and project coordinator Jane Schrock, was held May 31, 1995 at the West Greene Even Start site for staff members from the CAS ABLE program, West Greene Even Start and Washington-Greene Head Start. (See Appendix A) This gave the six staff attending an opportunity to discuss the barriers they face with teaching science to their students and to review the Family Science Activity Packets. The training for tutors (volunteers) on the importance of "Science Awareness" and the use of the science activities was conducted on May 23, 1995 at the Greene County Community Action Building. Three volunteers attended this training. (See Appendix A) The staff and volunteer trainings included explanation of the underlying science principle that each activity is designed to teach the adult students, and illustrating ways the activity can be incorporated into the existing curriculum.

The Family Science Activity Packets were used by parents involved in the Even Start program in Greene county, the Head Start program in Greene county and ABE classes in Washington and Greene counties. Each Packet includes 7-10 activities. Each activity

indicates the exploratory problem, process skills, concepts, materials provided, other materials needed, time needed for the activity, instructions and suggested extension activities. Also included is a science journal for adults and children to record their observations and drawings.

D. Positive Objectives Met and Partially Met

1. We successfully developed 34 Family Science Activities. These activities were compiled into four packets centered around the themes weather, water, plants and magnets. Each packet along with the materials provided were stored in 68 oz.laundry soap boxes, with handles, that had been covered with contac paper. This made the packets easy to store and transport. A training guide was developed for staff and volunteers that included the underlying science principles that each activity is designed to teach, the process skills utilized and illustration of ways the activity can be incorporated into existing adult/family education curriculum. A copy of the training guide is included with this report, (See Appendix D). Photos of individual packets are attached, (See Appendix E).

2. Objective 2 was partially met. The activity packets were piloted with 14 students involved in either a Family Education program (Even Start, Head Start, Family Center) or the CAS ABLE program. They were used by ABLE students who were parents of preschool, kindergarten, and first grade children. Staff and volunteers recorded adult's and children's reactions to the materials in the family's anecdotal portfolio journal as well as completing evaluation forms (samples and completed forms attached).

We were also able to introduce the science packets to six Head Start parents involved in a Kindergarten transition program in June.

3. The materials developed in this program were presented to the staff and volunteers of local ABLE, Even Start, Family Center and Head Start programs. Nine individuals participated as providers in the pilot usage of the activities.

4. Students, tutors and staff completed questionnaires/evaluation forms giving feedback regarding the usefulness of the activities to adult students and their children. (See Appendix F)

E. Objectives Not Met

2. Objective 2 was only partially met. While we reached the target number of adult students, we were not able to get full use of the packets for all participants during the contract period. Families in the Family Education programs are continuing to pilot and use the activities. Due to the length of time required to compile the packets and acquire the materials, the packets were not completed until April. This did not provide sufficient time to monitor the activity usage in many of our Act 143 programs which had to stop classes mid-May or early June due to budget restraints.

F. Evaluation

Evaluations were completed on each family science concept by staff and parents that participated. (See Appendix F) A statistical chart is included with the results of these evaluations. (See Appendix B), Copies of the staff, volunteer, and parent survey forms are also included. (See Appendix C)

G. Distribution

Copies of the report on Adding Family Science to ABLE Programs are available through the Department of Education and AdvancE at 333 Market Street, Harrisburg, PA 17126-0333; and at the Western Pennsylvania Adult Literacy Resource Center, 5347 William Flynn Highway, Rt. 8, Gibsonia, PA 15044-9644.

APPENDIX A

TRAINING ATTENDANCE

SIGN IN SHEET

May 23, 1995

1. Sam Pagni
2. Marcia Belding
3. David Todd
4. Stacy McCollum - staff
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Science Proposal Staff Training

May 31, 1995

Stacy McCollum
Karla A Bence
Jane Schrock
Jessie Dilts
Theresa Matuskey
Susan Pugliese
Dolores Hagle

: HEAD START TRAINING 1994/95

Training Let's Have Fun with Science DATE 6/22/95

Trainer Jeanne Williams LOCATION Waynesburg, PA

1.) Melanie Howard
2.) Tammy Cumberledge
3.) Janet Hysell
4.) [illegible]
5.) Maida Polen
6.) Loletta McClellan
7.) Theresa Matchey - Head Start Staff
8.) Sandy Vaughan - Head Start Staff
9.)
10.)
11.)
12.)
13.)
14.)
15.)
16.)
17.)
18.)
20.)
21.)
22.)
23.)
24.)
25.)
26.)

APPENDIX B

STATISTICAL CHART

SCIENCE PACKET

Use of Activities	# activities completed	# adults	# children	# staff and tutors	Concepts new to adult	Yes	No	Some	Concepts new to child	Yes	No	Some	How Packets helped devlop Science concepts in adults	by helping my child learn	by doing hands-on activities	the activities were fun
Water, Water Everywhere	14	4	5	3		0	3	1		4	0	0		3	3	3
It's Raining Cats and Dogs	2	1	2	1		1	0	0		1	0	0		1	1	1
Let's Get Growing	17	3	6	3		0	2	1		2	0	1		2	3	3
I'm Stuck on You	9	2	4	1		0	2	0		2	0	0		1	2	1

APPENDIX C

SAMPLE

PARENT EVALUATIONS

AND

STAFF AND TUTOR

QUESTIONAIRE

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used _____

3. Age(s) of child(children) these activities were done with _____

4. Was everything listed in "Materials Needed" in the packet? _____

5. Were the instructions easy to follow? _____

6. Were the activities easy for you and your child to use? _____

7. Were these science concepts new or unfamiliar to you? _____

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

____a. I learned by helping my child learn.
____ b. I learned by doing hands-on activities.
____ c. I learned because the activities were fun.
____ d. other - please list_____

_____

9. Were these science concepts new to your child/children? _____

10. Please write your observations about how your child reacted to these activities_____

_____

_____

_____

11. Did you change or add to these activities in any way? _____
How?_____

12. Do you have any suggestions that might improve these activities for future use?_____

_____

_____

Thank you for participating in **Let's Have Fun With Science!**

Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionnaire for each. (circle)
   - Water, Water Everywhere!
   - It's Raining Cats and Dogs!
   - Let's Get Growing!
   - I'm Stuck On You!

2. List the Activity numbers that were used _____

3. Age(s) of child(children) these activities were done with _____

4. Was everything listed in "Materials Needed" in the packet? _____

5. Were the instructions easy to follow? _____

6. Were the activities easy for the adult and child to use? _____

7. Do you feel the activities will increase science literacy? _____

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes _____
_____
_____
_____

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes _____
_____
_____
_____

10. Did the activities enhance the adult student's familiarity with the science concepts? _____

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? _____
_____
_____
_____

APPENDIX D

ADDING FAMILY SCIENCE TO ABLE PROGRAMS TRAINING GUIDE

Let's Have Fun.... With Science!

A Guide to Science Activities for Children and Their Parents

Handbook

For Staff and Volunteers

TRAINING GUIDE

1. Introduction 1

2. Development of Specific Activities 3

3. How to Guide Parents 7

4. Science Activity Packets 8

    "Water, Water Everywhere" 9

    "It's Raining Cats and Dogs" 19

    "Let's Get Growing" 33

    "I'm Stuck on You" 46

5. Sample Journal Cover 54

6. Materials and Vendors 55

7. Bibliography 56

Introduction

To a child, the world is full of exciting things to see, touch, feel, smell, take apart, put together..... As the child's first teacher, the parent plays a powerful role in encouraging and developing their child's natural curiosity about their environment. Even before children go to school they begin to develop "science literacy." Science literacy can be defined as the ability to observe, describe and identify the natural occurrences of the world in which we all live. As soon as they become aware of their environment, children's innate need to make sense of their world drives them to make further discoveries about how the world works.

In advanced societies such as ours, it is important for contributing members to be scientifically literate because our society depends heavily on science and technology for its cultural basis. However, the topic of science is often met with an attitude of trepidation by many of us who remember the rote memorization of lists of facts and principles that became our definition of "science". It is also met with an attitude of mystification by adults who dropped out of school without gaining a firm science foundation. Science in schools, as it had been presented in a traditional sense, can shut off children's search for knowledge and science literacy. Text book science often requires high reading levels, sophisticated problem solving skills, and contains an assumption that the reader has prior experience and familiarity with the concepts. It is difficult for some students to grasp science concepts when taught in this abstract, traditional method because science from the pages of a book has no real connection to students' understanding of their own world. They have not developed the skills necessary to process information in this form.

Science literacy is optimally gained gradually, over time, through a wide array of hands on activities as children make new discoveries and connect that discovery with prior knowledge. It is through these activities and discussion of the observations, that children learn science concepts

and gain the basic science skills necessary for higher level discoveries. Parents can facilitate this process by providing an environment where children can make the connections.

Making the connections can be especially problematic for children in families where adult family members have a negative memory of school in general and particularly of the sciences. Many adults enrolled in Family Literacy and Adult Basic Education (ABE) Programs find themselves lacking in the skill of making connections between what they observe and what they know about the world perhaps because they were exposed only to traditional teaching methods. Now they find it difficult to assist the development of science literacy in their children. They need to participate in hands on activities and discussions about the concepts demonstrated by the activities, since they are less likely to have had these opportunities in their own childhood.

How then can these adults rekindle their natural delight in "doing" science and seeing the world around them with a sense of wonder which is part of and prerequisite to the gaining of science literacy? The answer may well be by seeing the world through the eyes of their children.

It is natural for parents to assume that the schools will provide the science education of their children. In fact, science education in schools has changed to include a reliance on "active learning" models which help children make the connections and build science literacy. However, what can parents do to provide science education for their children who have not yet reached school age? And how can they continue to foster the development of science literacy in their school age children?

This project developed innovative materials of basic science concepts and skills to use with both ABLE students in traditional programs and in special family literacy programs. Science Activity packets were developed with the two fold outcome of presenting basic science concepts and skills to adult students and providing these students with specific activities to foster the

development of the concepts and skills with their young children. The materials are to become a part of family literacy programs operated by local Even Start, Head Start, and Family Center programs and are to be made available to other such programs in the state.

Development of Specific Activities

On September 7, 1994, the West Greene Even Start Program sponsored a group activity called "Fun With Science" in conjunction with the theme of the month "The World Around Us". This activity focused on parent-child interaction where parents guided their children through seven different science activities. Seven stations were set up. They consisted of Peat Pot Volcanoes- baking soda and vinegar mixed together in the top of an indented upside down peat pot; Evaporation - a damp sponge was wiped on a chalkboard to observe the evaporation process; Float or Sink - various objects were placed in a pan of water to observe whether they would float or sink; What Do You See? - many natural objects such as sea shells, coral, flowers, snake skin, etc., were available for children and parents to observe with a magnifying glass; Baby Plants - lima beans were soaked over night and children dissected them to find the parts of the seeds; Magnetism - a box of many different objects and magnets were available for children and parents to find out what materials are attracted to a magnet; Let's Make Music - jars filled with water to different levels and a spoon were used to discover the musical notes produced when the jars were tapped with the spoon. Instructions and all necessary materials for each activity were located at each station. Parents and children were able to discover together the wonders of simple science in everyday life. This group activity, with its focus on parent-child interaction and discovery, was the basis and starting point for "Let's Have Fun With Science".

In many ways, developing a <u>scientific attitude</u> in young children is more important than developing knowledge of specific science facts. A scientific attitude is a way of thinking about

the world around us. Assisting the developing scientific attitudes in students is seen as a prerequisite to learning science facts. Indeed, because the development of a scientific attitude in many adults enrolled in ABE Programs was impeded, they have had difficulty in acquiring scientific facts and concepts. The scientific attitudes that are to be gained through the use of these science activities are: curiosity, positive self image, positive approach to failure, persistence, and inventiveness.

Out of the development of scientific attitudes comes the development of process skills. These are the skills that allow children and adults to process new information through concrete experiences. They are called process skills because they are "doing skills". We learn them as part of the procedure of doing science activities. Development of process skills is important because they are the thinking skills necessary to learn not only science concepts, but are also necessary for coping with everyday life and for future study in science and mathematics. The process skills appropriate for early childhood are observing, comparing, classifying, measuring and communicating. However, some children and most ABE students will be ready to explore some of the higher level process skills: inferring, predicting, hypothesizing, defining and experimenting. The science activities included in this project emphasize the process skills appropriate for early childhood with a number of activities providing for the development of higher level skills.

- Observing involves describing something using the five senses (sight, smell, sound, touch, taste). This skill is learned by carefully watching to note events that might ordinarily go unnoticed. Observing is a fundamental skill upon which all other scientific skills are based. Every activity in "Let's Have Fun With Science" was designed to include development of this most important skill.
- Comparing is a skill that develops as observation skills increase. As this occurs, children

naturally begin to see likenesses and differences by comparing. Comparing is a precursor to the higher level skill of classifying. Many of the activities in "Let's Have Fun With Science" help develop comparing. For example, children are asked to compare how different temperatures of water feel, how various materials dissolve in water and how many paper clips various strengths of magnets are capable of picking up. Parents are taught to encourage the development of this skill by asking children to find likenesses and differences through out the activities.

- Classifying begins when children sort and put objects into groups. Observation and comparing are a prerequisite to this skill. Children are likely to sort and group by color, shape or size. Parents are taught to encourage the development of classifying skills within these activities by asking children to sort various seeds by shape, size and color; identifying plants by the parts that we eat; and identifying clouds by their shape, size and color.
- Measuring involves observing to identifying a quantity. It may involve numbers, distances, time, volume, or temperature. However, since standard units of measure such as inches, quarts or degrees are abstract concepts, they are difficult for children to grasp. Instead, measurement within these activities focuses on the use of non-standard measurement such as the use of a string to measure length, or coloring in boxes on a simple graph to represent a number. Parents are taught to encourage development of measuring by making a rain gauge, recording the amount of rain on a simple graph and measuring the distance colored water has moved up a celery stalk.
- Communicating is the skill of describing an event. Children communicate what they have observed in these activities through the use of a journal, simple graphs, orally and by

making their own books. Parents will find that children enjoy doing daily recording tasks such as helping to record the weather or describing what happened when a plant was deprived of sunshine. Communicating about science concepts helps to build science literacy. Every activity within "Let's Have Fun With Science" includes development of this important process skill.

In addition to developing scientific attitudes and process skills, these science activities were developed with specific science concepts in mind. Because young children find meaning in familiar topics, these concepts were chosen because they involve common, recognizable subjects that are found in everyday life. In addition, they provide a base of science understanding which many adults may lack. In "Water, Water Everywhere!", children and parents will explore the properties of water, an element that is vital to life. Understanding aspects and properties of water is necessary to understanding other science concepts such as those covered in "It's Raining Cats and Dogs!" Here, the science activities include exploring weather, evaporation and the water cycle. An understanding of water is also a starting place for the activities in "Let's Get Growing!" Through these activities parents and children learn about plants and their needs. In addition, "I'm Stuck On You!" involves parents and children in interesting and fun activities that explore the concepts of magnetism.

Through the use of these activities, parents and children will increase their basic understanding of science concepts and build basic skills necessary for developing a scientific mind that is needed in today's society. Both parents and children will find that science and learning in general can be and should be fun! It is through the cultivation of this atmosphere of learning that a questioning mind emerges. Many parents pattern their responses after the traditional teaching methods they have primarily been exposed to and customarily answer "Because..." when their

child asks "Why?" Through the use of these activities, the parent with a scientific attitude will learn a new response: "Let's find out...."

How to Guide Parents

Many times the adults in our Adult and Family Literacy Programs need a lot of nurturing when they undertake a new activity. If these activities are presented as a fun way to help children learn as they build their own basic science skills, parents may feel less threatened about the science that they will be learning. It is very important that parents understand that the end result of theses activities is not as important as the actual process of doing them. A sincere interest in the processes of science must come first. The facts of science will fall in place later. Many times scientists don't get the results they expected in spite of the fact that they did everything "right". At these times, they look at the process of doing the activity and see what they can learn from it. Keeping an open mind and a positive outlook will help fend off discouragement at those times when parents want to make sure that everything turns out right. Just like scientists, parents need to remember that it is a rare occurrence when everything turns as expected, especially when working with children. Parents need to know that it is okay for the activity to come out differently as long as parent and child are having fun, interacting, and observing science. They should be encouraged to allow children to be involved with every aspect of the activities, from setting up to cleaning up. Both children and parents should feel a sense of ownership in these learning experiences.

SCIENCE ACTIVITY

PACKETS

"WATER, WATER EVERYWHERE"

"IT'S RAINING CATS AND DOGS"

"LET'S GET GROWING"

"I'M STUCK ON YOU"

Water, Water Everywhere!

An Investigation of Water

Water, Water Everywhere!

An Investigation of Water

Activity 1

Investigation: Water Exploratory Problem: Finding out about water.	
Process Skills: Observing, Measuring, Communicating Concepts: Water can be poured. It takes the shape of the container it is in.	
Materials Provided: Funnels Droppers Plastic cup	Materials Needed: Many containers of various sizes and shapes Sink or plastic dish pan Water
Time Needed for Activity: Approximately ½ hour.	

Instructions:

1. Fill the dish pan or sink with water. If using the dish pan, it may be easier to take it outside to the yard so water will not be spilled inside the house. Or, this activity can be done at bath time.
2. Allow your child to explore the water by playing with it. Use funnels and droppers to find out how water moves and flows. Fill cups and pour them out. Have fun exploring!
3. While playing, assist your child in observing how water can be poured from one container to another. Hold a cup of water high above the sink or dishpan and pour it into the water. Turn an empty cup upside down and push it down into the surface of the water. Hold the empty cup upside down in the water and then turn it sideways. Turn it right side up while still under the water. What happens? What did you see?
4. Make a pin hole in the bottom of a plastic cup. Turn the empty cup upside down and lower it slowly into the water until it is completely underwater. What happens?
5. Ask your child how you can find out how much water a container will hold. Use a smaller cup to fill the larger container. Count how many cups it takes to fill the container. Now, see how many cups it takes to fill a different container. Repeat with several other containers. Which container is bigger? Which holds more? Can you put the containers in order form biggest to smallest?
6. Draw or write in your journal about what you saw .

Extension:

1. Fill two cups with water. Pour one onto a plate or flat pan. Which is more, the water in the pan or in the cup? (They are the same.)

Water, Water Everywhere!

An Investigation of Water

Activity 2

Investigation: Water Exploratory Problem: Exploring with water.	
Process Skills: Observing, Comparing, Communicating Concepts: Water can feel and look differently.	
Materials Provided: None	Materials Needed: 3 large pots or dishpans Water Ice cubes
Time Needed for Activity: Approximately ½ hour.	
Instructions: 1. Fill one dishpan with cold water, one with warm water and one with ice cubes. 2. Allow your child to play with and explore the water in each pan. 3. Encourage your child to make observations about the water. How do they feel? What do they look like? How are the different kinds of water alike? How are they different? 4. Draw or write about what you saw and felt in your journal.	
Extension: 1. Put one hand into a pan of warm water. Take it out of the warm water and put it into a pan of cold water. Now put your other hand in the cold water. Is there a difference in how the water feels to each hand?	

Water, Water Everywhere!

An Investigation of Water

Activity 3

Investigation: Water Exploratory Problem: What happens to water when it is cooled or heated?
Process Skills: Observing, Communicating Concepts: Water changes form when heated or cooled. When heated it boils and becomes steam. When cooled it freezes to become ice. We can also call this the three states of matter: solid, liquid and gas. When water freezes, it expands.
Materials Provided: None Materials Needed: Water Glass or jar Small pan Plastic container (such as a margarine tub)
Time Needed for Activity: Approximately 20 minutes immediately, then wait about two hours until the water freezes.
Instructions: 1. Have your child assist as you fill the glass or jar with water. Pour half of the water in the pan. Pour the other half in the plastic container. 2. Ask your child what he or she thinks would happen if the water got very cold? Make a mark on the side of the plastic container to mark the level of the water. Place the plastic container of water in the freezer. 3. Ask your child what he or she thinks would happen if the water got very hot? Place the pan of water on the stove and bring to a boil. Watch your child carefully so as not to get too close. Watch the steam rise out of the pan. Allow the water to boil away being very careful not to burn the pan. Ask your child what happened to the water? Explain that when the water got very hot, it became a gas or steam. Try to think of other times you have seen water become steam - a cup of hot cocoa, a pot of cooking food, etc. 4. Check the plastic container of water in the freezer periodically with your child. When it is frozen, take it out. Ask your child what happened to the water? Explain that when the water got very cold it froze into ice. Remind your child of the mark that was made on the side of the container to show the level of the water. Has the level changed now that the water is frozen? (The level is higher now because water expands when it freezes.) Try to think of other times that you have seen ice - icicles and frozen puddles in the winter, ice cubes in a drink, etc. 5. Draw or write about what you saw in your journal.

Continued

Extension:
1. Make a food that requires boiling water such as boiled eggs or noodles.
2. Make ice pops! Use a purchased ice pop maker to freeze fruit juice or pour juice into small cups and place in freezer. When partially frozen, put popsicle sticks in the middle and freeze till solid.

Water, Water Everywhere!

An Investigation of Water

Activity 4

Investigation: Water Exploratory Problem: What kinds of objects float in water?
Process Skills: Observing, Predicting, Communicating Concepts: Some objects float and some objects sink in water.
Materials Provided: Aluminum foil Materials Needed: Dishpan or sink Water Small objects such as keys, pencils, marbles, pieces of leather, plastic, wood, etc.
Time Needed for Activity: Approximately ½ hour.
Instructions: 1. Gather many small objects from around the house and put them in a box or bag. 2. Fill the sink or dishpan with water. 3. Let your child experiment by placing each of the objects in the water to see if it will sink or float. Make a pile of things that sink and a pile of those that float. What can you say about the things in each pile? (The things that float are light for their size.) 4. Roll one piece of aluminum foil into a ball. Does it sink or float? Shape the other piece of aluminum foil into the shape of a boat. Does it sink or float? 5. Draw or write about what you saw in your journal.
Extension: 1. What can you do to an object that floats to make it sink? Try it and see. 2. Can you float? The next time you go swimming or take a bath, try to float.

Water, Water Everywhere!

An Investigation of Water

Activity 5

Investigation: Water
Exploratory Problem: What will happen if something is added to a container already filled to the top with water?

Process Skills: Observing, Communicating
Concepts: Water forms a bulge that rises above the rim of a container that is overly filled with water. (This is due to the property of cohesion - molecules of water tend to stick together. Therefore, water molecules on the surface are pulled toward the molecules underneath them. This causes the tight "skin" on top of the water that is called surface tension.)

Materials Provided:	Materials Needed:
Plastic medicine vial	Water
Paper clips	Plate
Dropper	Clear glass or plastic cup
Cork	

Time Needed for Activity: Approximately 15 minutes.

Instructions:
1. Place the vial on the plate. Use the dropper to fill the vial to just below the top.
2. What will happen if you drop paper clips in the vial? Will the water overflow? Try it and see. Notice how the water bulges above the rim of the vial before it over flows.
3. How many paper clips did you add before the water overflowed?
4. Draw or write about what you saw in your journal.

Extension:
1. Fill a clear glass or plastic cup with water till it is bulging above the rim. Float a small cork on the surface. Where does it float, in the center or near the side of the cup? (No matter where you place the cork on the surface of the water, it will always move to the center. The center is the highest part of the bulge of water. Floating objects always move to the highest point.

Water, Water Everywhere!

An Investigation of Water

Activity 6

Investigation: Water Exploratory Problem: How will the surface of a partially filled glass of water look?
Process Skills: Observation Concepts: The surface of the water is sunken when a glass of water is partially filled. (This is due to the property of adhesion - the molecules of water are attracted to other substances, in this case, the glass.)
Materials Provided: Plastic cup Cork Materials Needed: Water Clear glass or plastic cup
Time Needed for Activity: Approximately 10 minutes.
Instructions: 1. Pour some water into a clear glass or plastic cup so that the water level is below the top of the glass. Look through the side of the glass at the surface of the water. What do you notice this time? (The surface of the water is higher at the edges of the glass. This is due to the property of adhesion - the molecules of water are attracted to the glass.) 2. Draw or write about what you saw in your journal.
Extension: 1. Based on what you learned in the previous lesson, what do you think will happen if you float a cork on the surface of a glass of water that is partially filled? Try it and see. Where does it float, in the center or near the side of the cup? (No matter where you place the cork on the surface of the water it will always move to the edge. This is the highest point in a partially filled glass of water. Floating objects always move to the highest point.)

Water, Water Everywhere!

An Investigation of Water

Activity 7

Investigation: Water Exploratory Problem: What happens when certain materials are mixed with water?
Process Skills: Observing, Comparing, Measuring, Communicating Concepts: Some materials dissolve in water. Other materials don't dissolve in water. (When a substance dissolves in water or other liquid, it is dispersed in the liquid to form a mixture.) When a substance mixes with water but does not dissolve, the substance is in suspension.

Materials Provided:	Materials Needed:
Plastic cups	Water
Food coloring	Spoon
Baby food jar	Salt
	Vegetable oil
	Sand
	Dish detergent

Time Needed for Activity: Approximately 30 minutes.
Instructions: 1. Fill a cup with cool water. Ask your child what would happen if salt was added to the water? What would happen to the water? What would happen to the salt? Try it and see. Add salt to the water one spoonful at a time. Stir and observe after each addition. What happened to the salt? (It dissolved in the water.) Put your finger in the water and taste it. Is it salty? How many spoonsful of salt can you add before it doesn't dissolve any more? Write the number in your journal. 2. Repeat the activity with warm water. How many spoonsful of salt will dissolve now? Write it in your journal. 3. Now, fill another cup with water and add a small amount of vegetable oil. Stir and observe. Does the oil dissolve in the water? Can you mix it in? Let the water and oil sit for a few minutes. What happens? (The oil will not dissolve in or mix with the water. When stirred, the oil may break up into smaller particles but after sitting it will come together on the surface of the water. 4. Try mixing sand with water. Does it dissolve? (When a substance mixes with water but does not dissolve, the substance is suspended in the water.) 5. Draw or write about what you saw in your journal.

Continued

Extension:
1. Try mixing other substances with water. Try dish detergent. How does it change the water? Does it dissolve?
2. Make a wave jar. Fill the baby food jar halfway with water. Add several drops of food coloring. Fill the jar the rest of the way up with vegetable oil. Put on the lid and screw down tightly. (You may want to use a hot glue gun to seal the lid.) Let your child shake the jar to create waves. Talk about why this works - because the water and oil don't mix.
3. Make iced tea or lemonade. Stir in sugar to sweeten it and watch the sugar dissolve.

It's Raining Cats and Dogs

An Investigation of Weather

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 1

Investigation: Weather
Exploratory Problem: What is today's weather like? Observing and recording the weather.

Process Skills: Observing, Comparing,Classifying, Measuring, Communicating
Concepts: The weather is what is happening outside in the space beginning at the earth's surface and extending upwards 6 to 10 miles. It is described by temperature, moisture and wind among others. The weather changes. Weather changes can be recorded. Weather changes with the seasons.

Materials Provided:
Cardboard circle
Brass fastener
Cardboard arrow
Weather Calendar
Weather Pictures
Weather Graph
Glue Stick

Materials Needed:
Scissors
Marker, pen or pencil

Time Needed for Activity: Approximately 10 minutes every day for several weeks. This activity can be continued for an extended period of time.

Instructions:
1. Work with your child to construct the Weather Wheel. Use one of each kind of Weather Picture to label each of the sections on the cardboard circle. Label each section with the word that describes each weather condition (sunny, snowy, rainy, windy, cloudy,). Attach the cardboard arrow to the center of the circle with the brass fastener.
2. Each day, look out the window, step out on the porch or front steps or go out into the yard to observe the weather. Talk about what you see. Use your Weather Wheel to show what kind of weather you observed.
3. After several days of observing the weather, suggest to your child that it would be fun to keep track of what the weather is doing by making a chart. Work with your child to construct a Weather Calendar. Use the Weather Calendar provided. Label the top with the name of the month and number each day appropriately. Each day, after you observe the weather and use the Weather Wheel, put a weather picture that shows the appropriate weather on the right day.
4. At the end of each week, review the week's weather. Talk with your child about what kind of weather you saw.
5. At the end of the month, assist your child in counting how many sunny, rainy, snowy, windy or cloudy days there were in the month. Work with your child to construct a simple Weather Graph. Use the graph provided. For each day of a each kind of weather, color in one corresponding square on the graph.

Continued

Extension:
1. Watch the weather report on television. Talk about the job of a meteorologist: to report and predict the weather. See if the Weather Person's prediction was right.
2. Look for the weather report in a newspaper. How does it compare to the weather report on the television? Which do you like better?
3. After about a month of observing and recording the weather, begin to talk to your child about the seasons of the year. What kind of weather can be expected in the Spring, Summer, Fall and Winter? For example, in the Spring, the weather begins to get warmer and sunnier but there is also rain. Talk about what season of the year you are in right now. Based on the season of the year that you are in and the information you learned by recording and graphing the previous months weather, will there be more sunny days, cloudy days or rainy days in the next month? Will there be cold, cool, warm or hot weather? Make a prediction and write it down in your journal. Now continue to observe, record and graph the weather and find out if your prediction was right! If your prediction was not right, talk about why. Weather is influenced by many factors and it is not always possible to tell exactly what will happen.

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 2

Investigation: Weather
Exploratory Problem: Where does the water on a wet article go when it dries? What is this process called?

Process Skills: Observing, Measuring, Communicating, Inferring
Concepts: When water turns to vapor naturally, it is called evaporation. The vapor goes into the air.

Materials Provided:
None

Materials Needed:
- Dishcloth
- A piece of cloth - wash cloth, rag or towel.
- Clear plastic cup or jar
- Quart size glass jar or other large glass jar
- Plate
- Several papertowels
- Water
- Permanent marker or rubberband

Time Needed for Activity: This is a series of activities that can be done simultaneously, the longest one lasting several days, the shortest one lasting only a few minutes.

Instructions:
1. Remind your child of the water activity done previously where water was changed to vapor by heating. Ask your child where the water went? (It turned into steam or vapor and went up into the air.)
2. Assist your child in wetting a dishcloth and allow him/her to wipe the table or other surface. Observe how the water slowly disappears. Ask your child where the water went. Accept all answers.
3. Wet a cloth and hang it out to dry. (This activity can be done when hanging laundry on the clothesline.) Check on the cloth periodically to see what is happening. Ask your child where the water went. Accept all answers.
4. Fill the cup or jar half full of water. Use a permanent marker to mark the level of the water on the outside of the jar. Or mark the level of the water by stretching a rubber band around the outside of the jar at the level of the water. Let the jar stand undisturbed for several days. Check on the level of the water once or twice a day and mark the level of the water each time. Ask your child where the water went. Accept all answers.

Continued

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 3

Investigation: Weather
Exploratory Problem: How can we tell if there is water in the air? Where does the water on the sides of a cold object come from?

Process Skills: Observing, Communicating
Concepts: There is water in the air in the form of a gas called water vapor. When the vapor is cooled, it turns back into water droplets. This process is called condensation.

Materials Provided:	Materials Needed:
None	Glass jar with lid Ice cubes Water

Time Needed for Activity: Approximately 30 minutes.

Instructions:
1. Remind your child of the water activity where water was changed into a gas or vapor by heating. Ask your child where the water went? (It turned into steam or vapor and went up into the air.)
2. Show your child the glass jar and have her/him feel that it is completely dry.
3. Fill the jar with water and ice cubes. Put the lid on tightly so your child will be sure that no water can leak out. Have your child feel the jar again. It is cold but still dry.
4. After a few minutes, water droplets will begin to form on the outside of the jar. Ask where the water came from. (When the air around the jar touched the cold sides of the jar, the water vapor in the air changed into water droplets. This is called condensation.)
5. Draw or write about what you saw in your journal.

Extension:
1. Look for condensation in other places: on the outside of a bottle of milk that has been out on the table for awhile, on the outside of the toilet tank, above pots of hot food, on windows.

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 4

Investigation: Weather Exploratory Problem: How do clouds make rain?
Process Skills: Observing, Communicating Concepts: When water evaporates the water vapor rises into the sky and forms clouds. When the vapor cools (or when the air is so full of moisture that it can't hold anymore) it turns back into water droplets which come down from the sky as rain, or in cold weather, snow sleet or hail. This process is called precipitation.

Materials Provided:	Materials Needed:
None	Boiling water in a pot 9 x 9 inch metal cake pan (or similar container) Ice Pot holders

Time Needed for Activity: Approximately 30 minutes.
Instructions: 1. Bring the water to a boil in the pot. Remove from the stove and place on a pot holder on a table where your child can see. Be sure that your child understands that the water is hot and he or she is not to come too close or touch the pot or water. Put ice in the cake pan. Protecting your hands with pot holders, hold the bottom of the ice filled pan over the steam that rises from the hot water. The steam rising from the pot condenses on the bottom of the cold cake pan forming water droplets. When the droplets get heavy enough, they fall down. You can help this process along by jiggling the pan to make the drops fall. 2. Draw or write about what you saw in your journal.
Extension: 1. The next time it rains, take a good hard look at what is happening. You can even put on your boots and raincoat and go for a walk in the rain. What do you see? What do you feel? Draw or write about it in your journal.

5. Allow your child to examine the quart jar to make sure it is perfectly dry inside. Fold or bunch up the papertowels so they will fit in the mouth of the quart jar. Wet the papertowels with warm water and put them on the plate. Turn the quart jar upside down on the plate, with the papertowels inside the mouth of the jar. In a short time water droplets will form on the sides of the jar. Ask your child where the drops of water come from? (From the wet papertowel.) Explain to your child that when water turns into vapor naturally it is called evaporation. Ask your child where was the water vapor going when it was stopped by the sides of the jar? (Into the air.)
6. Ask your child why you can't see the water in the air when it turns into vapor and evaporates. Explain that the dropplets of water are so tiny and spaced so far apart that you can't see them.
7. Draw or write about what you saw in your journal.

Extension:
1. Where else do you see evaporation? Look at puddles after it has rained. If you have a fish tank, do you need to add water to it once in a while?

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 5

Investigation: Weather Exploratory Problem: Where do the clouds get the water to make rain?	
Process Skills: Observing, Communicating Concepts: Water evaporates from many different places.	
Materials Provided: Plastic cups	Materials Needed: Glass jar Small plastic bag and twist tie Hot water
Time Needed for Activity: Approximately one hour.	

Instructions:

1. Take your child outside to a green, grassy area. Have your child feel the inside of the jar so she/he will be sure it is perfectly dry. Turn the jar upside down on the grass. Now, go have some fun for a little while.
2. When you came back to your jar, what did you see? Water droplets formed on the inside of the jar. Ask your child where the water came from. (It evaporated from the grass.)
3. Allow your child to repeat this activity in various places to see if water evaporates from them. Try dirt, the top of a picnic table, asphalt, etc.
4. Pick a leaf from a tree and place inside a plastic bag. Seal the bag tightly with a twist tie. After a little while water droplets will form inside the bag. Ask your child where the water droplets came from. (They evaporated from the leaf.)
5. Draw a picture of a cloud made of tiny droplets of water in your journal.

Extension:

1. Make a cloud! Pour ¼ cup hot water into a plastic cup. Invert a second cup and place it on top ot the first cup. Look into the cup and you will see a cloud. You can use a flash light to help you see it better. Dim the lights and shine the flash light through the cup. The cloud is made up of tiny droplets of water.

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 6

Investigation: Weather Exploratory Problem: How can we tell how much it has rained?	
Process Skills: Observing, Measuring, Communicating Concepts: The amount of rain that falls in an area can be measured.	
Materials Provided: Rainfall or Snowfall graph	Materials Needed: A wide-mouth jar Masking tape Marker A ruler
Time Needed for Activity: Approximately 30 minutes to prepare. Then wait for a rainy day.	
Instructions: 1. Tape a piece of masking tape to the side of the jar so it extends in a straight line from the top to the bottom. 2. Use the ruler and marker to mark ¼ inch increments on the tape on the side of the jar. 3. Place the jar outside in an open area. Each time it rains check to see how much rain has fallen by looking at the side of the jar. Write the amount of rain and the date in your journal. 4. Use the information to make a simple graph. If you do this activity for an extended period of time you can compare the rainfall from month to month.	
Extension: 1. Change your rain gauge into a snow gauge. Use the same gauge to measure snowfall. 2. Compare what you found out with what the weather person says.	

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 7

Investigation: Weather
Exploratory Problem: Can the clouds tell us what the weather will be like?

Process Skills: Observing, Comparing, Classifying, Communicating, Inferring
Concepts: The size and shape of clouds can tell us what the weather may be.

Materials Provided:
Cloud cards
Cloud pictures
Cloud chart
Cotton batting
Heavy paper
Glue stick

Materials Needed:
Crayons

Time Needed for Activity: Approximately 20 minutes every morning for a week

Instructions:
1. Observe cloud formations every morning for a week or longer. Use the Cloud cards to identify the kinds of clouds you see: Encourage your child to describe the clouds you see. Ask your child which card looks the most like the clouds you see. Talk about the names of the clouds and what kind of weather it usually brings.
2. Display the Cloud chart on wall or refrigerator. Glue a cloud picture that describes the clouds that you saw to the space provided. Remind your child of the type of weather this cloud usually brings and tell your child to "be on the look out for it" during the day. If that weather occurs, write "yes" in the column next to the picture.
3. At the end of the week, look at your Cloud chart. Is there a connection between the clouds you saw and the weather you had? Draw or write about it in you journal.

Extension:
1. Use cotton batting, glue stick and heavy paper to make cloud pictures. Cut cloud shapes out of cotton batting to make rounded clouds. Pull the cotton batting apart to make wispy clouds. Make rain clouds by stroking a gray marker over the cotton batting. Label the kinds of clouds you have made.
2. Go cloud watching! Watch clouds as they float in the sky. What kind of shapes do you see?

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 8

Investigation: Weather Exploratory Problem: How do water vapor, clouds and rain work together?
Process Skills: Observing, Measuring, Communicating Concepts: Water on the earth's surface continually evaporates, condenses in the sky and falls again as rain, hail or snow. This is called the water cycle.
Materials Provided: Water Cycle puzzle Wonderful Water Book Materials Needed: Crayons
Time Needed for Activity: Approximately one hour.
Instructions: 1. Use the water cycle puzzle to explain to your child how the water cycle works. You have already discovered with your child, through the previous activities, how each of the components of the water cycles works. You've found out about evaporation (water turning into vapor), condensation (when water vapor turns back into water droplets when it is cooled). and precipitation (when water or snow falls from the sky). Now, you will be putting all three parts together to make a whole idea. Choose one of the three puzzle pieces. It doesn't matter which puzzle piece you start with because a cycle is continuous and has no beginning or ending. Remind your child of the activities that were done to demonstrate that part of the water cycle. Continue with each of the pieces. Now talk with your child about how a cycle is continuous and that water goes around and around in the cycle. It continually changes from water vapor and back to water through the processes of evaporation, condensation and precipitation.
Extension: 1. Make a Wonderful Water Book. Color the pages and put together.

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 9

Investigation: Weather
Exploratory Problem: What is a thermometer? How can we use it to measure how hot or cold it is outside?

Process Skills: Observing, Comparing, Measuring, Communicating
Concepts: Temperature is a part of weather. Temperature is the measure of the amount of hotness or coldness in the environment. Temperature is measured with a thermometer. Temperature can be recorded.

Materials Provided:	Materials Needed:
Thermometer	Two jars
Thermometer pictures	Warm and cold water
Temperature Chart	

Time Needed for Activity: Several days or longer. This activity can be done over a extended period.

Instructions:
1. Show the thermometer to your child showing where the level of the liquid in the tube is. Color a thermometer picture to show the level of the liquid.
2. Fill one jar with cold water. Allow your child to feel the water. Have your child tell you if the water is warm or cold. Place the thermometer in the water. Wait about a minute and remove the thermometer. Ask your child to show you where the level of the liquid in the thermometer tube moved to. Color a thermometer picture to show the new level.
3. Fill another jar with warm water. Allow your child to feel the water. Have your child tell you if the water is warm or cold. Again, show the thermometer to your child asking him/her to point out the level of the liquid in the tube. Place the thermometer in the warm water. Wait about a minute and remove the thermometer. Ask your child to show you where the level of the liquid in the thermometer tube moved to. Color a thermometer picture to show the new level.
4. Explaining that the thermometer will tell you how hot or cold the water is. Explain that the liquid in the thermometer moves up or down in the tube according to how warm or cold something is. The numbers on the thermometer are the way we measure how hot or cold it is. It is not so important that your child reads the actual numbers. It is more important that your child associates the level of the liquid in the tube with the amount of heat or coolness in the environment: the higher the level, the warmer it is; the lower the level, the colder it is.

Continued

5. Now place the thermometer outside in a shady location (Direct sun will cause the thermometer to measure a much higher temperature than the temperature of the environment). Check the temperature twice a day for several days (or for an extended period in conjunction with the weather activity). Good times to check are in the morning when it is still cool and in the middle of the day when it has warmed up. This will give your child the opportunity to make the association between the amount of warmth or coolness and the level of the liquid in the thermometer tube. Record the temperature of the day by coloring a thermometer picture on the temperature chart.

Extension:

1. Show your child a picture of a thermometer that has been colored to show the temperature. Ask what kind of clothes they would wear if it was that temperature outside. Repeat with several other pictures.
2. Cut pictures of clothing out of magazines and catalogues to show what kind of clothes you would wear on warm days and on cold days.

It's Raining Cats and Dogs!

An Investigation of Weather

Activity 10

Investigation: Weather
Exploratory Problem: How can we tell how hard the wind is blowing? How can we tell which direction the wind is blowing?

Process Skills: Observing,Comparing, Measuring, Communicating
Concepts: We can tell how hard the wind is blowing and which direction the wind is blowing by observing trees and other objects in the environment.

Materials Provided:	Materials Needed:
Wind pictures	None
Tag paper strip	
Colored tissue paper strips	
Glue stick	
Yarn	

Time Needed for Activity: Approximately one hour.

Instructions:
1. Go for a wind walk. Walk outside and look for signs of wind: Are the leaves on the trees moving? Can you feel a breeze on your skin? Are leaves or other debris being blown into the air?
2. Look at the wind pictures. Which picture best describes the wind today? No wind? A little windy? Very windy?
3. Make a simple wind sock: Glue the short ends of the tag paper together to form a tube, overlapping the edges one inch. Glue the tissue paper strips evenly spaced around to the bottom edge of the tag paper tube so they hang down. Make four evenly spaced holes in the top edge of the tag paper tube. Cut yarn in half. Holding both pieces of yarn together, fold the yarn in half and tie a knot a short way down from the fold, forming a loop. Tie each of the four loose yarn ends to each of the holes in the top of the tag paper tube. Hang outside by the loop. Use the wind sock to tell you how windy it is. Choose the wind picture that best describes the wind conditions that you see.

Extension:
1. Make your own wind! Place a few small lightweight items on a tabletop or other flat surface. Let your child experiment by blowing through to straw to move the objects across the surface. Draw or write about what happened in your journal.

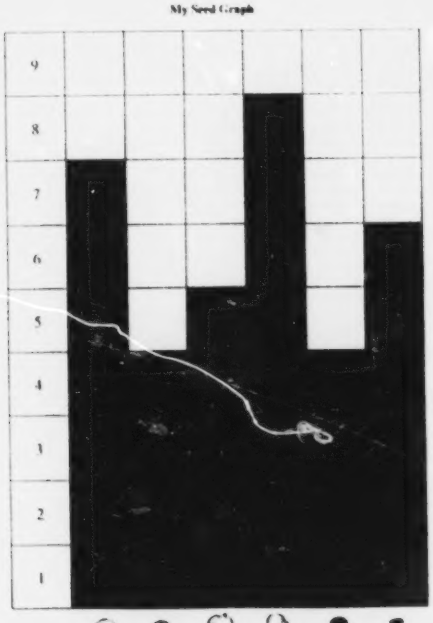
Let's Get Growing!

An Investigation of Plants

Activity 1

Investigation: Seeds Exploratory Problem: How can we tell seeds apart?
Process Skills: Observing, Comparing, Classifying, Communicating Concepts: Seeds come in many shapes and sizes.
Materials Provided: Bag of mixed dry seeds Small plastic cups My Seed Graph Materials Needed: None
Time Needed for Activity: Approximately ½ to 1 hour.
Instructions: 1. Look at the bag of seeds with your child. 2. Ask your child to describe some of the seeds. Demonstrate by saying, "This seed is black and small. Do you see any others that look like this? How does this one look?" etc. 3. Ask, "How could we find out how many different kinds of seeds there are?" 4. Set out the cups. Allow your child to come up with ideas. Encourage the use of the cups to sort the seeds. 5. Ask, "How many kinds of seeds are there? Tell me about them." Encourage your child to describe the seeds. 6. Draw and color pictures of the seeds in your journal.
Extension: 1. Make a simple graph of the different types of seeds. Using the "My Seed Graph" provided, glue or tape each type of seed along the bottom of the graph. Or color a picture of each seed. Number the grid on the side of the graph. Have your child color one square for each seed of each type. See illustration below. 3. Make a picture by gluing the seeds to a heavy piece of paper or cardboard.

Note: Please watch small children carefully so they do not put seeds in their mouths.



Activity 2

Investigation: Seeds Exploratory Problem: What are the parts of a seed?
Process Skills: Observing, Comparing, Communicating Concepts: Seeds have three parts: a protective seed cover, an embryo, or baby plant, and a food supply in the form of two seed leaves called cotyledons.
Materials Provided: Dry lima bean seeds Magnifying glass Materials Needed: Jar or bowl Water
Time Needed for Activity: Approximately ½ to 1 hour.
Instructions: 1. Soak several lima bean seeds overnight in a jar or bowl of water. Leave several bean seeds unsoaked. 2. Observe with your child, the appearance of the dry seeds. Ask, "How do they feel? Are the hard? Are they soft? Do they have a smell? Can you break them open with your fingers?" etc. Encourage your child to describe the seeds. 3. Now, observe with your child, the appearance of the soaked seeds. Repeat the above line of questioning. Ask, "Why do you think these seeds are different?" (Water made the seed soft.) 4. Using the magnifying glass, ask your child to find out how many parts the seeds are made of. Demonstrate how to remove the protective coating of the seed and break the seed in two pieces. Look for the baby plant inside. 5. Draw and color pictures of the parts of the seed in your journal.
Extension: 1. Soak other kinds of seeds. How are they alike and different from the lima bean seeds?

Let's Get Growing!

An Investigation of Plants

Activity 3

Investigation: Seeds
Exploratory Problem: What do seeds look like when they begin to grow into plants? What do seeds need to begin to grow?

Process Skills: Observing, Comparing, Measuring, Communicating, Predicting, Experimenting
Concepts: Seeds soften from moisture in the soil. The protective coating splits and a tiny root and stem emerge. Seeds need water to begin to grow.

Materials Provided:	Materials Needed:
Dry lima bean seeds	Glass jar Paper towels Water

Time Needed for Activity: 3 to 5 days.

Instructions:
1. Soak some lima bean seeds overnight.
2. Line the inside of the jar with wet, folded paper towels.
3. Use crumpled paper towels to fill the center of the jar and to hold the lining towel against the sides of the jar.
4. Poke some soaked lima bean seeds down between the paper towel lining and the glass.
5. Fill the jar with water to the lowest seed. The paper towel will soak up the water and keep the seeds wet. Do not fill the jar past the lowest bean because the seed may die from lack of oxygen.
6. Observe the seeds everyday. How long did it take for a root to grow? How long did it take for a stem to grow?
7. Write or draw pictures in your journal of what you see .
8. Repeat the activity but this time do not soak the seeds and do not wet the paper towels or fill the jar with water. Observe the seeds. What happens? What is the difference between the seeds that were watered and the seeds that were not? What do seeds need to begin to grow?

Extension:
1. Use other seeds, such as corn. How are they alike or different from the lima bean seeds?
2. Will a cooked seed grow? Try it and see.
3. What would happen if you watered the seed with salt water or other liquid? Try it and see.

Activity 4

Investigation: Seeds Exploratory Problem: Can we eat seeds?
Process Skills: Observing, Communicating Concepts: Some seeds are good to eat.
Materials Provided: Alfalfa seeds Rubber band Square of cheese cloth Seeds That We Eat Materials Needed: Glass jar Water Bowl
Time Needed for Activity: Approximately 4 days
Instructions: 1. Put the alfalfa seeds in a jar. Soak the alfalfa seeds in warm water overnight. 2. Stretch the cheese cloth over the mouth of the jar and hold in place with the rubber band. 3. Drain the seeds through the cheese cloth and rinse with cool water. Drain again. 4. Place the jar in a bowl upside down, on an angle, to allow excess water to drain. 5. Rinse and drain the seeds twice a day until the seeds are one to two inches long. 6. Add sprouted seeds to salad or put on a sandwich instead of lettuce. 7. Can you think of other kinds of seeds that we eat? Read together Seeds That We Eat. Draw some seeds in your journal. (Peas, rice, corn, wheat, etc.)
Extension: 1. When making a Jack-o-lantern or cooking pumpkin for pie, save the seeds. Soak the seeds for several hours in warm, salted water. Roast the seeds on a greased cookie tray at 300 degrees until golden brown. Eat warm or cool.

Let's Get Growing!

An Investigation of Plants

Activity 5

Investigation: Plants Exploratory Problem: What other parts of plants do we eat?	
Process Skils: Observing, Classifying, Communicating Concepts: We eat many different parts of plants: stems, roots, leaves, and flowers in addition to seeds.	
Materials Provided: "Plants That We Eat" Booklet Glue stick	Materials Needed: Old magazines and grocery store circulars Crayons Scissors
Time Needed for Activity: Several hours.	
Instructions: 1. What other parts of plants do we eat? Go to the produce section in a grocery store. Help your child identify what parts of plants we eat. What parts are leaves, stems, fruit, roots, flowers? (Leaves: lettuce, kale, spinach, cabbage, etc. Roots: potatoes, yams, beets, carrots, etc. Fruit: apples, oranges, pears, plums, tomatoes, etc. Stems: celery, asparagus, etc. Flowers: broccoli, cauliflower, etc. Note: When we eat green beans we are actually eating both the fruit and the seeds. The seeds are contained within the pod or fruit of the plant 2. Label the pages of the "Plants That We Eat" with *Seeds*, *Fruit*, *Stems*, *Roots*, and *Flowers*. Cut out pictures of parts of plants that we eat from old magazines and grocery store circulars and glue them in your booklet on the correct pages.	
Extension: 1. Discuss with your child the different ways we eat plants: in salads, soups, baked , boiled, etc.	

Let's Get Growing!

An Investigation of Plants

Activity 6

Investigation: Plants
Exploratory Problem: What do plants need to stay healthy?

Process Skills: Observing, Comparing, Communicating. Inferring
Concepts: Plants need water, soil and sunlight to grow and stay healthy.

Materials Provided:
Potting soil
Small plastic cups
Popcorn seeds

Materials Needed:
Water

Time Needed for Activity: One or two weeks. The three separate activities can be done simultaneously.

Instructions:

1. Fill one plastic cup with potting soil. Plant several popcorn seeds in the cup. Place several popcorn seeds in another cup without soil. Water both cups and place in a sunny, warm place. Observe the two plants everyday. Make notes or draw in your journal about what you see. Ask your child to describe what has happened to each of the plants. Ask, "What is one thing that plants need to stay healthy? (Soil.) How do you know?" (The plant without soil did not grow as well, did not get as big, was not as healthy, etc.)
2. Fill 2 paper cups with potting soil. Plant several popcorn seeds in each. Water both cups and keep moist until the seeds begin to grow. Keep in a sunny, warm place. When the small plants are about 2 inches high, stop watering one, but continue watering the other when needed. Observe the two plants everyday. Make notes or draw in your journal about what you see. Ask your child to describe what has happened to each of the plants. Ask, "What is another thing that plants need to stay healthy? (Water.) How do you know?" (The unwatered plant dried up, died, etc.)
3. Fill 2 paper cups with potting soil. Plant several popcorn seeds in each. Water both cups and keep moist, but do not over water. When the plants begin to emerge, put one cup in a dark place such as a closet or cabinet. Place the other cup in a sunny, warm place. Observe the two plants everyday. Make notes or draw in your journal about what you see. Ask your child to describe what has happened to each of the plants. Ask, "What is another thing that plants need to stay healthy? (Sunlight.) How do you know?" (The plant that didn't have sunlight didn't grow as well, was unhealthy, died, etc.)
4. Draw or write about what you saw in your journal.

Extension:

1. Now that you have found out what plants need to stay healthy, what are some things that you need to stay healthy? (Food, water, shelter, rest, etc.) Write or draw them in your journal.

Let's Get Growing!

An Investigation of Plants

Activity 7

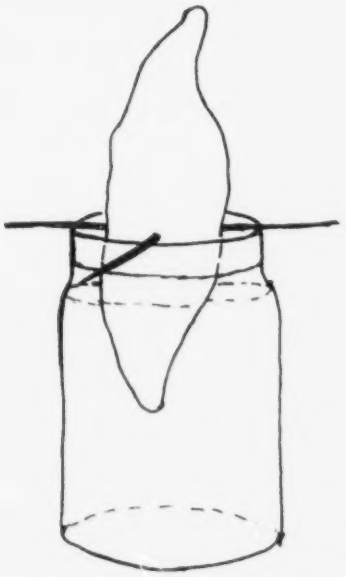
Investigation: Plants Exploratory Problem: What are the life stages of a plant?
Process Skills: Observing, Ordering, Communicating, Predicting Concepts: A plant starts as a seed in the ground, sprouts, grows into a seedling and then a full grown plant. The life of plants is a cycle; a full grown plant will produce seeds so more plants will grow.
Materials Provided: Life Stages of a Plant cards Materials Needed: None
Time Needed for Activity: 15 minutes to ½ hour.
Instructions: 1. Show your child cards one through five. Talk together about the different life stages of a plant. 2. Let your child arrange the cards in sequence. 3. Now show your child card six, which depicts a full grown plant that has produced seeds. Talk about this stage in the plants life: it produces seeds so more plants of the same kind can grow. Add card six to the end of the sequence. 4. Ask your child, "If we plant a lima bean seed, what kind of plant will grow? If we plant a pumpkin seed, will carrots grow? Why not?" (Seeds from one kind of plant will only grow the same kind of plant)
Extension: 1. Plant a lima bean seed in a cup. Tape the card showing the seed underground to the cup. As the seed emerges and begins to grow, change the card to indicate the proper stage in the plants life. 2. In the fall, take a walk outside to find plants that have produced seeds so that more plants can grow next year.

Let's Get Growing!

An Investigation of Plants

Activity 8

Investigation: Plants Exploratory Problem: Do plants only grow from seeds?
Process Skills: Observing, Communicating Concepts: Some plants grow from roots.
Materials Provided: Toothpicks Materials Needed: A sweet potato Wide mouth jar Water
Time Needed for Activity: Several weeks.
Instructions: 1. Look at the sweet potato to find the stem end. There will be a small scar where the sweet potato was attached to the plant. 2. Place the sweet potato in a jar of water with the stem end up. Stick toothpicks around the middle of the sweet potato to support it if needed. Only about a third of the sweet potato should be in the water. Maintain the water at this level. (See illustration.) 3. Keep the sweet potato in the jar of water in a warm, dark place until roots and stems begin to grow. Then move it to a well lighted place. 4. What grew first, a root or a stem? How long did it take? What happened as the stems grew bigger? Write or draw about it in your journal.
Extension: 1. After the sweet potato has grown, plant it in a pot of soil. It will make a beautiful house plant.



Activity 9

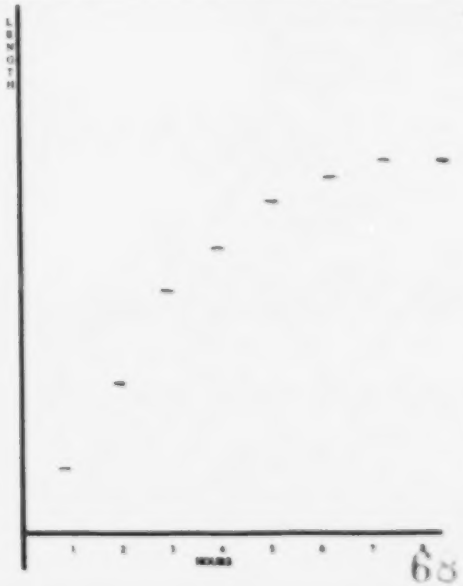
Investigation: Plants Exploratory Problem: How does water in the roots of the plant get to the leaves?
Process Skills: Observing, Measuring, Predicting, Communicating Concepts: Water moves through the plant from the stem to the leaves through water-conducting tubes.

Materials Provided:	Materials Needed:
Food coloring	One celery stalk
Piece of string	Water
	Glass jar

Time Needed for Activity: 6 to 8 hours.

Instructions:
1. Fill the jar with water.
2. Add several drops of food coloring until the water is deeply colored.
3. Cut the lower end of the celery stalk at an angle and put the stalk in the colored water.
4. Check the celery stalk every hour. What do you notice each time you look at the celery?
5. Use the string to see how far the colored water rises each hour: Hold the string next to the celery stalk with one end even with the bottom of the stalk. (Do not remove the celery from the water.) Mark the string even with the top of the celery stalk. Every hour, mark on the string how far the colored water has risen. Tape the string in your journal when you are done. Write or draw about what you saw.

Extension:
1. Make a simple graph using the information you found out about the water rising in the celery stalk. Use the graph provided. Mark the hours on the vertical axis. Lay your marked string on the paper with the bottom end along the bottom line of the graph. Mark the distance that colored water rose on the graph for each hour. See illustration below.
2. It is St. Patrick's Day and you have a white flower. You want to turn it green for the holiday. How could you do it?



Activity 10

Investigation: Plants
Exploratory Problem: Are plants strong?

Process Skills: Observing, Predicting, Communicating
Concepts: Growing plants can be strong enough to move objects.

Materials Provided:	Materials Needed:
Small plastic container with lid	Water
Kidney bean seeds	
Plaster of Paris	
Plastic cup	

Time Needed for Activity: Overnight.

Instructions:
1. Fill the container with kidney bean seeds.
2. Add water to the top of the container. Put on the lid.
3. Ask your child, "What do you think might happen?" Wait to see what happens overnight. (The lid will pop off).
4. Ask your child, "Why do you think the lid popped off?" (The seeds absorbed the water and began to grow.)
5. Draw or write about it in your journal.

Extension:
1. Place several pea seeds on the bottom of a small cup. Mix a one part of Plaster of Paris with two parts of water and pour it into the cup on top of the pea seeds to a depth of ½ to 1 inch deep. Observe the seeds for several days. Based on what you observed with the kidney beans, what do you think will happen? (The seeds absorb the water from the plaster of Paris and begin to grow. They are strong enough to lift or even break the hardened plaster of Paris.)
2. Look for signs of damage done by plants in your yard, neighborhood or town. Look for things such as broken concrete, cracked sidewalks, crumbling bricks, etc.

My Seed Graph

12										
11										
10										
9										
8										
7										
6										
5										
4										
3										
2										
1										

71

45

J'm Stuck on You!

An Investigation of Magnets

I'm Stuck on You!

An Investigation of Magnets

Activity 1

Investigation: Magnets Exploratory Problem: What is a magnet?	
Process Skills: Observing, Communicating Concepts: Observing a magnet	
Materials Provided: Magnets	Materials Needed: None
Time Needed for Activity: Approximately 15 minutes.	
Instructions: 1. Allow your child to explore the magnets by playing with them. 2. While playing, assist your child in observing how magnets attract from a distance, that is, a magnet held at a distance from another magnet will still pull the magnet toward itself. In fact, it usually jumps to the magnet. 3. Observe what happens when you put different parts of the magnets together - some parts push away from each other. 4. Stack magnets, make different shapes, put paper between magnets, etc. Take cues from your child as to what to do with the magnets. Just have fun exploring!	
Extension: 1. Draw the shapes of the magnets in your journal.	

I'm Stuck on You!

An Investigation of Magnets

Activity 2

Investigation: Magnets Exploratory Problem: What does a magnet do?
Process Skills: Observing, Comparing, Classifying, Communicating, Predicting, Inferring Concepts: A magnet attracts (draws to itself) items made of iron and steel.
Materials Provided: Magnets Magnet Yes and No signs Materials Needed: Two bags of various small items such as wood, coins, plastic, paper clips, hairpins, leather, marbles, etc.
Time Needed for Activity: Approximately ½ hour.
Instructions: 1. Take the items out of the first bag. 2. Touch a magnet to each of the items. 3. Which items are attracted by the magnet? Put them in a pile and label it with the Yes magnet sign. 4. Which items are not attracted by the magnet? Put them in a pile and label it with the No magnet sign. 5. Now put the items away and take out the second bag. Can you guess which items will be attracted by the magnet? Put them into piles labeled with Yes and No magnet signs. 6. Now test your guesses by using a magnet. Did you guess right? If you put some thing in the wrong pile, change it. 7. What can you say about those things that were pulled by the magnet? Can you make a rule about what things are pulled by a magnet? (A magnet attracts items made of certain metals. It is not important that your child know which metals are attracted to the magnet. It is more important that your child understands that some kinds of metal are attracted and we can always find out by using a magnet to test the metal.) Draw or write about it in your journal.
Extension: 1. Guess which items around your house will be attracted to the magnet. Then try them out with your magnets. Draw or write about them in your journal.

I'm Stuck on You!

An Investigation of Magnets

Activity 3

Investigation: Magnets Exploratory Problem: How can you tell how strong a magnet is?
Process Skills: Observing, Comparing, Classifying, Measuring, Communicating, Predicting Concepts: Some magnets are stronger than others.
Materials Provided: Various magnets Paperclips Materials Needed: None
Time Needed for Activity: Approximately ½ to 1 hour.
Instructions: 1. Make a pile of paperclips. Choose a magnet. Put the magnet into the pile of paperclips and to attract as many paperclips as possible. Count the paperclips that were attracted by the magnet. Then leave them in a pile. (Seeing how big the pile is may be better understood than a number amount.) Place the magnet next to the pile to identify it. 2. Do the same thing with the rest of the magnets. 3. Which magnet picked up the most paper clips? Which pile of paperclips is bigger? Which magnet is the most powerful? 4. Put the magnets in order from weakest to strongest. 5. Record what you found out about the magnets in your journal. Drawing a picture of each magnet and next to it draw a picture of the size of the pile of paperclips it picked up. You can count the number of paperclips too. Write the number next to the picture of the pile of paperclips.
Extension: 1. Are all parts of the magnet equally strong? Will different parts of the magnet pick up more paperclips? Try it and find out.

J'm Stuck on You!

An Investigation of Magnets

Activity 4

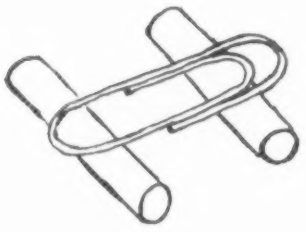
Investigation: Magnets Exploratory Problem: How can a magnet be made? Can it be made stronger or weaker?
Process Skills: Observing, Comparing, Measuring, Communicating Concepts: An iron nail can be magnetized with a magnet. It can be made stronger or weaker.
Materials Provided: Bar Magnet Iron nail Paperclips Materials Needed: None
Time Needed for Activity: Approximately 15 minutes.
Instructions: 1. Poke the iron nail into a pile of paperclips to see if it attracts them. 2. Stroke the nail with the magnet in one direction ten times. Poke the nail into the paperclips again to see if any are attracted. Count the paperclips and write it down in your journal. 3. Stroke the nail with the magnet twenty times. Now how many paperclips can be picked up? Write it down in your journal. 4. Stroke the nail with the magnet thirty times. Now how many paperclips can be picked up? Write it down in your journal. 5. Now wait ten minutes and see if the nail will pick up any paperclips. Was the number different? Write it down in your journal. Why do you think the magnet was less powerful after waiting? Explain that a magnet looses it's power over time. 6. Stroke the nail 40 times in the same direction. How many paperclips will it pick up? Now drop the nail several times on a hard surface such as a linoleum floor or a sidewalk. How many paperclips will it pick up now? How did the nail loose it's magnetic power? Explain that dropping or pounding magnets makes them weaker or causes them to loose power.
Extension: 1. Can other items be magnetized? Try a screw driver and other items.

I'm Stuck on You!

An Investigation of Magnets

Activity 5

Investigation: Magnets Exploratory Problem: Can magnets be used to move things?
Process Skills: Observing, Communicating Concepts: Magnetic power can be used to do work.
Materials Provided: Bar magnet Paperclips Race track on plastic tray Straw Materials Needed: None
Time Needed for Activity: Approximately 15 minutes to ½ hour.
Instructions: 1. Place a paperclip on the race track. Explain that this is a race car that wants to win a race. How can we use the magnet to make the car go? Allow your child to experiment. Demonstrate by holding the magnet under the track and use it to move the paperclip around the track. 2. Cut two pieces of straw 1½ inches each. Place them close together and place a paperclip on top of the straw pieces. (See illustration below.) Ask how we could make this car move? Allow your child to experiment. Demonstrate by holding the magnet in front of the paperclip car. Move the magnet closer until the car begins to move. 3. Draw or write about what you saw in your journal.
Extension: 1. Can you make an invention that uses a magnet to make something move? Draw it in your journal.



I'm Stuck on You!

An Investigation of Magnets

Activity 6

Investigation: Magnets Exploratory Problem: Can magnets attract objects through water?	
Process Skills: Observing, Communicating, Predicting, Inferring Concepts: Magnets can attract objects through water.	
Materials Provided: Magnet Several paperclips	Materials Needed: Glass jar Water
Time Needed for Activity: Approximately 15 minutes.	
Instructions: 1. Fill jar with water and place several paperclips in the water. 2. Move the magnet around outside the jar to make the paperclips move. 3. Remind your child how magnets can attract from a distance (Activity 1). Ask why the paperclip moves? Explain that the magnetic force passes through the glass and water to the paperclip. 4. Draw or write about what you saw in your journal.	
Extension: 1. What else does magnetic force pass through? Think of things to try: paper, hair, wood, plastic, etc. Try using two magnets on either side of an item. Can two magnets attract each other through your finger?	

I'm Stuck on You!

An Investigation of Magnets

Activity 7

Investigation: Magnets
Exploratory Problem: How can a magnet be used to separate materials?

Process Skills: Observing, Communicating
Concepts: A magnet can be used to remove materials that are attracted to it from other materials that are mixed with it.

Materials Provided:	Materials Needed:
Bar Magnet	Small jar with lid
Salt	
Iron filings	
Plastic tray	
Plastic spoon	
Plastic bag	

Time Needed for Activity: Approximately ½ to 1 hour.

Instructions:
1. Pour the salt and the iron filings into a jar. Put on the lid and shake to mix the materials.
2. Pour the mixture into the plastic tray. Ask your child to try to separate them using the spoon.
3. Now, wrap the bar magnet in the plastic bag and ask your child to use it to separate the iron filings from the salt. To remove the iron filings from the magnet, remove the plastic bag.
4. Was it easier to separate the salt and the iron filings with the spoon or with the magnet?
5. Draw or write about what you saw in your journal.

Extension:
1. Get a few spoonfuls of sand or loose soil from a sand box or garden. Cover the magnet with a plastic bag. Stick the magnet into the sand or soil. Did anything stick to the magnet? Some soils have many small bits of iron in them.

Let's Have Fun.... With Science!

My Science Journal

The following items can be purchased locally at:
Grocery Stores, Department Stores, Office Supply Stores, Lumber Companies, Hardware Stores, Educational Supply Stores.

Plastic Bags
Salt
Clear plastic cups
Aluminum foil
Food Coloring
Dried Beans
Potting Soil
Plaster of Paris
Glue Sticks
Iron Nails
Cork Stoppers
Iron Filings

The following items can be purchased through the following companies:
* Nasco 901 Janesville Ave. Fort Atkinson, Wisconsin 53538-0901
* Creative Educational Surplus 9801 James Circle, Suite C Bloomington,Minnesota55431
* Kurtz Brothers 400 Reed St. P.O. Box 392 Clearfield, Pa. 16830-0392

3" Economy Magnet
Assorted Magnets
Magnifying Glasses
Funnels of Fun
Droppers
Pipettes
White Stickers

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APPENDIX E

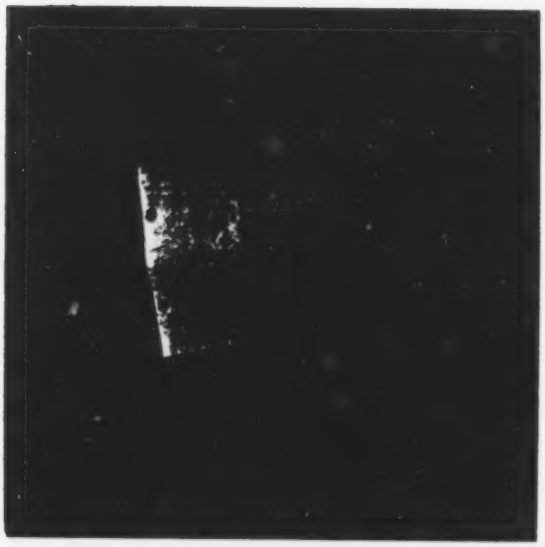
PHOTOS

SHOWING PACKETS

WITH MATERIALS

Items found in each "Water, Water Everywhere!" activity packet:

large funnel
small funnel
large droppers
small droppers
empty medicine vial
aluminum foil
plastic cups
1 baby food jar
1 bottle food coloring
1 small cork
1 box paper clips
plastic detergent scoops



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Items found in each "Let's Get Growing" activity packet:

"Seeds That We Eat" booklet
"Plants That We Eat" booklet
glue stick
24" string
food coloring
"Stages of a Plant" cards
magnifying glass
toothpicks
rubber band
8" square of cheese cloth
12 plastic cups
1 small margarine container
dry kidney beans (enough to fill margarine container)
bag of mixed dry beans (several each of at least 8 different types)
3 tablespoons dry alfalfa seeds
1 cup dry lima beans
½ cup pop corn seeds
⅛ cup plaster of Paris
6 cups potting soil

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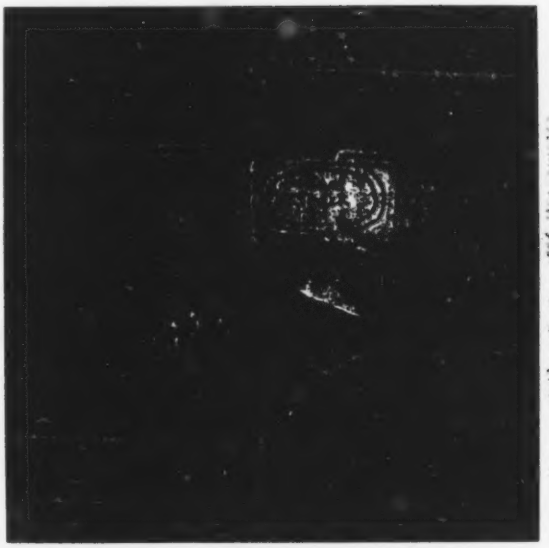
Items found in each "I'm Stuck On You!" activity packet:

4 round magnets
4 triangular magnets
1 bar magnet
1 large nail
iron filings
salt
1 plastic spoon
1 straw
yes and no magnet signs
1 box paper clips
plastic tray
plastic tray with race track



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APPENDIX F

COMPLETED

PARENT EVALUATIONS

AND

STAFF AND TUTOR

QUESTIONNAIRES

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) ~~Water, Water Everywhere!~~
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used 1 + 4

3. Age(s) of child(children) these activities were done with 5 + 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? some were

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

___✓___a. I learned by helping my child learn.
____ b. I learned by doing hands-on activities.
____ c. I learned because the activities were fun.
____ d. other - please list_____

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities They really liked playing in the water

11. Did you change or add to these activities in any way? no.
How?_____

12. Do you have any suggestions that might improve these activities for future use?_____

Thank you for participating in **Let's Have Fun With Science!**

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used all

3. Age(s) of child(children) these activities were done with 3½ yrs.

4. Was everything listed in "Materials Needed" in the packet? food coloring

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? no

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

✓ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
✓ c. I learned because the activities were fun.
___ d. other - please list

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities He enjoyed them and learned things that you would think kids know because you do. We both really enjoyed them

11. Did you change or add to these activities in any way? yes
How? I asked more questions.

12. Do you have any suggestions that might improve these activities for future use? NO

Thank you for participating in *Let's Have Fun With Science!*

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used 1

3. Age(s) of child(children) these activities were done with 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? some were

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

✓ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
✓ c. I learned because the activities were fun.
___ d. other - please list _____

9. Were these science concepts new to your child/children? _____

10. Please write your observations about how your child reacted to these activities _____

11. Did you change or add to these activities in any way? _____
How? _____

12. Do you have any suggestions that might improve these activities for future use? _____

Thank you for participating in *Let's Have Fun With Science!*

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Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used 1 - 2

3. Age(s) of child(children) these activities were done with 3

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? Yes for my child just a bit

7. Were these science concepts new or unfamiliar to you? Familiar

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

___ a. I learned by helping my child learn.
__✓__ b. I learned by doing hands-on activities.
__✓__ c. I learned because the activities were fun.
___ d. other - please list_____

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities_____

11. Did you change or add to these activities in any way? _____
How?_____

12. Do you have any suggestions that might improve these activities for future use?_____

Thank you for participating in **Let's Have Fun With Science!**

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionairre for each. (circle) (Water, Water Everywhere!)
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that were used 1

3. Age(s) of child(children) these activities were done with 3

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes [illegible]

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes water is fun! Putting a [illegible]

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes [illegible]

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionairre for each. (circle) (Water, Water Everywhere!)
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that were used 1

3. Age(s) of child(children) these activities were done with 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? definitely

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes [illegible]

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes [illegible]

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? [illegible]

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than ~~one unit was used, please~~ fill out a questionairre for each. (circle) (Water, Water Everywhere!) ~~It's Raining Cats and Dogs!~~ (Let's Get Growing!) I'm Stuck On You!

2. List the Activity numbers that were used all

3. Age(s) of child(children) these activities were done with 3

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes The adult couldn't believe that these were science units. She said she was having too much fun. She didn't realize that learning science could be so enjoyable. She enjoyed Water, Water Everywhere so much that she scheduled another unit.

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes The child laughed and enjoyed the activities. In Water, Water Everywhere Activity 1, he continuously searched for various containers just to make sure that the water did take the "new" containers shape. He was eager to complete

10. Did the activities enhance the adult student's familiarity with the science concepts? yes another unit

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes

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Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used 1, 3

3. Age(s) of child(children) these activities were done with 6 + 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? yes

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

___✓___a. I learned by helping my child learn.
___✓___b. I learned by doing hands-on activities.
___✓___c. I learned because the activities were fun.
____ d. other - please list_____

_____

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities They were amazed at the ice melting and vapor rising.

11. Did you change or add to these activities in any way? no
How?_____

12. Do you have any suggestions that might improve these activities for future use?_____

_____

Thank you for participating in *Let's Have Fun With Science!*

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionnaire for each. (circle)
   - Water, Water Everywhere!
   - It's Raining Cats and Dogs!
   - Let's Get Growing!
   - I'm Stuck On You!

2. List the Activity numbers that were used 1, 3

3. Age(s) of child(children) these activities were done with 5, 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Adults learned as part of helping children. Were eager to see children discover which encouraged their own curiosity

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes Children enjoyed finding out about weather. They observed making thinking about wind, rain, sun, etc. They were curious to find out about what weather they would have the next day. They compared what they saw to/ what the weather man predicted

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes. Students learned by being actively involved in activities

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Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
(Let's Get Growing!)
I'm Stuck On You!

2. List the Activity numbers that you used 1, 2

3. Age(s) of child(children) these activities were done with 5, 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? no- done before at Even Start

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

___ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
___ c. I learned because the activities were fun.
✓ d. other - please list the children enjoyed doing them.

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities They really liked seeing the different sizes & shapes and they made neat photos out of the seed. They liked taking the seed apart.

11. Did you change or add to these activities in any way? no
How?

12. Do you have any suggestions that might improve these activities for future use? They were fine

Thank you for participating in **Let's Have Fun With Science!**

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used all - except 8 + 9

3. Age(s) of child(children) these activities were done with 3½ yrs.

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? no

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

✓ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
✓ c. I learned because the activities were fun.
___ d. other - please list we did all and both really enjoyed them.

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities He really learned a lot about seeds and how they grow and what it takes to grow.

11. Did you change or add to these activities in any way? yes
How? He asked more questions.

12. Do you have any suggestions that might improve these activities for future use? No

Thank you for participating in *Let's Have Fun With Science!*

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
(Let's Get Growing!)
I'm Stuck On You!

2. List the Activity numbers that you used 1-7

3. Age(s) of child(children) these activities were done with 8, 6, 5

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? some new

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

✓ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
✓ c. I learned because the activities were fun.
___ d. other - please list_____

9. Were these science concepts new to your child/children? some new

10. Please write your observations about how your child reacted to these activities
They were very excited when the seeds sprouted.

11. Did you change or add to these activities in any way? no
How?

12. Do you have any suggestions that might improve these activities for future use? no

Thank you for participating in *Let's Have Fun With Science!*

Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionairre for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
(Let's Get Growing!)
I'm Stuck On You!

2. List the Activity numbers that were used 1 plus talking w/ children of the they completed more activities.

3. Age(s) of child(children) these activities were done with 8, 6, 5

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Three families used packets, both
worksheets and the Space Man was fun
with the parents

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes The kids were really excited
at the end I told the parents
to go and check out the library

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? The children were excited
from the beginning & this continued
throughout. They were always asking "when
are we going to do the experiment again"
They made use of most of the activities.

Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionnaire for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
~~Let's Get Growing!~~
I'm Stuck On You!

2. List the Activity numbers that were used 1, 2

3. Age(s) of child(children) these activities were done with 5, 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Had the opportunity to participate in the learning process with children. Eager for discovery

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes Child active and involved in activities. Enjoyed finding out about seeds. Curious about what the next activities were.

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes. They "discovered" the science concepts as part doing the activities

Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionnaire for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that were used 1, 2

3. Age(s) of child(children) these activities were done with 5, 4

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Felt good about herself because she was able to understand growing processes and help her children as well. Was curious about parts of plant.

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes Kids were surprised to see sizes and shapes of seeds. were curious about parts of seeds

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes - were actively involved in the learning process

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Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that you used 1-7

3. Age(s) of child(children) these activities were done with 1½ - 7

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? no

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

___ a. I learned by helping my child learn.
__✓__ b. I learned by doing hands-on activities.
___ c. I learned because the activities were fun.
___ d. other - please list _____

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities She really enjoyed them.

11. Did you change or add to these activities in any way? NO
How? _____

12. Do you have any suggestions that might improve these activities for future use? NO

Thank you for participating in **Let's Have Fun With Science!**

Let's Have Fun With Science

Activity Evaluation

1. What science unit did you use? If more than one unit was used, please fill out an evaluation for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
(I'm Stuck On You!)

2. List the Activity numbers that you used 1, 2

3. Age(s) of child(children) these activities were done with 6 and 3

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for you and your child to use? yes

7. Were these science concepts new or unfamiliar to you? no

8. In what ways did these activities help you to understand and or become more familiar with these concepts?

✓ a. I learned by helping my child learn.
✓ b. I learned by doing hands-on activities.
✓ c. I learned because the activities were fun.
___ d. other - please list_____

9. Were these science concepts new to your child/children? yes

10. Please write your observations about how your child reacted to these activities was amazed and surprised that magnets were so strong

11. Did you change or add to these activities in any way? Tried lots of different
How? things that might stick to magnets

12. Do you have any suggestions that might improve these activities for future use?
Warn parents not to let children put magnets in iron filings without putting plastic bag on magnet - iron filings do not come off!

Thank you for participating in **Let's Have Fun With Science!**

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionairre for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
I'm Stuck On You!

2. List the Activity numbers that were used all

3. Age(s) of child(children) these activities were done with 6

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Mother smiled & encouraged daughter to explore with the magnets - said "I can't believe this is science."

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes Stacy wanted to learn more science concepts.

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? Yes - Stacy explored the attraction between the objects & magnets without realizing it. Often, children won't sit through lessons about 'science' if they don't have something tangible to relate it to.

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Let's Have Fun With Science

Questionnaire for Staff and Tutors

1. What science unit did your student use? If more than one unit was used, please fill out a questionairre for each. (circle) Water, Water Everywhere!
It's Raining Cats and Dogs!
Let's Get Growing!
~~I'm Stuck On You!~~

2. List the Activity numbers that were used 1,2

3. Age(s) of child(children) these activities were done with 6, 3

4. Was everything listed in "Materials Needed" in the packet? yes

5. Were the instructions easy to follow? yes

6. Were the activities easy for the adult and child to use? yes

7. Do you feel the activities will increase science literacy? yes

8. State your observation of the impact the activities had on the adult and note any increases in scientific attitudes Adults were eager to do activities with the kids. They were involved w/ helping children observe, and discuss results.

9. State your observation of the impact the activities had on the child/children and note any increases in scientific attitudes Children were active and involved in all activities. They were curious about the results of activities and eager to try more

10. Did the activities enhance the adult student's familiarity with the science concepts? yes

11. Do you feel the scientific attitudes/ process skills/ science concepts were successfully gained through the hands-on technique? In what way? yes - adults + students were able to learn as part of the process of doing the activities.